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SEGREGATION: WHAT IT IS AND HOW IT CAN BE MEASURED

Since the beginning of the 1990s, segregation levels have increased in many Swedish regions → Low-income earners and people born outside Europe are increasingly overrepresented in urban distressed neighbourhoods → More knowledge is needed about the mechanisms through which segregation arises and the effects derived from it

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Title: Segregation: What it is and how it can be measured

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SUMMARY

Since the early 1990s segregation levels have increased in many Swedish regions and low-income earners and people born outside Europe are increasingly overrepresented in urban distressed neighbourhoods. There is a great deal of research on segregation, but more knowledge is needed about the mechanisms through which segregation arises, the potential (causal) effects that derive from its different forms and which experiences that can impede the development of segregation. The term 'segregation' often occurs in media and in political rhetoric, but the concept is more complex than what often appears. In this document, we aim to discuss different ways to approach the concept of segregation, mechanisms for and consequences of segregation, and methods that can be used to measure and analyse different forms of segregation.

1. Introduction

With his book Cities of Tomorrow (1988), Peter Hall (1932-2014), one of the pioneers of European urban research and planning, entered the debate that contributed to both modern urban research and 20th century urban planning, describing reactions to the 19th century slum development with examples from London, Paris, Berlin and New York. There was increasing realisation that the growing urban misery needed to end. Something drastic needed to be done to end extreme overcrowding, disease, homelessness, violence and crime (Hall 1988).

The contemporary Swedish city does not have a great deal of similarities to the situation portrayed by Hall. However, in today's debate on segregation and deprived neighbourhoods in Sweden, there is a recurring undertone of concern for the geographical concentration of poverty and the "other". In Sweden today, the perceived threat does not come from what was previously called "the slums", but from "the suburbs" - which is often sweepingly described in definite form, a singular entity (Franzén 2008).

However, it is not only the deprived areas that are segregated. Segregation means distinction, and more than one group or area is required if we are to speak of a distinction. Segregation takes place on a city level and includes both resource-poor and resource-rich people. In order to understand the segregation problem and its underlying structures, and to be able to act against it, action is required from national political level. The social integration challenge cannot be solved solely with initiatives from respective municipalities and not by exclusively targeting specific areas (Urban 2016).

However, segregation is not a problem for everyone. There are many examples of how resource-rich groups segregate themselves from the rest of society – with advantageous outcomes. For those who are resource-poor and live in the most distressed areas, segregation is less advantageous. The opportunities for these groups to influence their situation are often limited.

So why are the cities segregated? What does the pattern of segregation look like? And what are the consequences? The questions about housing segregation are both complex and complicated to research. Segregation research faces many methodological challenges, such as categorisation and finding appropriate methods for analysis. Although extensive research is available, many questions remain.

2. The Swedish history of segregation

The emergence of segregated cities coincided largely with the industrialist era. With industrialism, work and housing became separated for most of the population. Socio-economic stratification between different districts became more apparent and the pattern of division soon turned more or less permanent. Most often, a city was divided into two "halves" - for example, East and West.

Swedish social housing policy, in place from the Second World War until the economic crisis of the 1990s, did not change this basic pattern, even though it radically changed the housing conditions of the population. For example, investment in the Million Dwellings Programme (miljonprogrammet) during the 1960s and early 1970s resulted in almost everyone living in modern housing and significantly reduced overcrowding in Sweden. As cities grew bigger and were adapted for car traffic, most people lived in planned residential areas. These residential areas were often clearly defined from each other and the rest of the city.

In the long term, however, the Million Dwellings Programme contributed to increased segregation - an unintended consequence of residential planning. Few had expected post-war growth to slow down, as it did with the oil crisis of 1974. Suddenly, there was a temporary surplus of housing. The housing surplus resulted in increasing resettlement, which in turn strengthened segregation. The middle class moved from the Million Dwellings Programme rental areas to detached housing in the new areas that rapidly took form in the 1970s. The resettlement contributed to a general criticism of the "suburbs" that began emerging in the autumn of 1968 (Franzén&Sandstedt 1981). At the same time, upgrading and renovations of the inner-city rental housing stock lead to an increased status of these areas. The deregulation of both the freehold homeowner and condominium markets gave additional leverage to these new trends, where the "suburb" became a negatively loaded concept.

The growing housing segregation led to increasing levels of socio-economic segregation. It also expanded to include ethnic segregation, when newly arrived refugees found housing in the areas now abandoned by working and middle-class families. At the same time, the basic segregation pattern began to shift towards a distinction between centre and periphery. These new trends were strengthened further with the 1990s crisis and the dismantling of social housing policy. Socio-economic and ethnic differences grew, gentrification of certain neighbourhoods increased, housing shortages and overcrowding increased. At the same time, there was a redirection of investments towards new housing tailored to the housing market's top segment. This development led to spatial polarisation between the centre and the periphery.

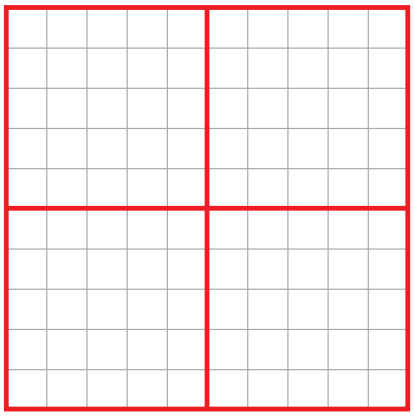
3. Measuring segregation

In order to measure, calculate and illustrate the population's geographical distribution within a city, a division into social categories and geography is required. We need to

answer questions like: Who belongs to the "middle class" or "working class"? Who are "high/low income-earners"? Who is "Somali", "Kurdish", "Turkish" or "Swedish"? Who is "young" and who is "middle-aged"? In other words, who belongs with whom and thereby differs from others? Measuring settlement patterns also requires questions like: What is a neighbourhood? How should residential areas be defined?

Determining a reasonable geographic level requires theoretical considerations. How the city is divided - into four, 25 or 100 districts - affects the calculation of segregation levels. A city or city district that appears to be severely segregated with a fine-grain division will appear much less segregated if divided into fewer areas. The simple rule is that segregation levels will appear lower, the fewer areas we divide the city into. The reason is that small areas contain less variety than large ones. Large areas therefore hide much of the housing segregation, for example by pooling villa and rental areas. Figure 1 illustrates this basic geographical categorisation problem. The critical segregation researcher must always ask: How have the calculations been made and why with this exact breakdown? In more recent Swedish research, a geographical division based on coordinate-based individual data is increasingly applied to determine the individual's neighbourhood (Östh et al., 2014b). The advantage of this approach is that areas can be determined independently of administrative divisions and that regional or cross-country comparisons (using different administrative divisions) thus are more consistent.

Figure 1. Schematic illustration of the fundamental problem with housing segregation: how is the city divided?



City divided into 4 or 100 districts. *Differences in settlement patterns appear greater the more districts a city is divided into. If the city is divided into fewer districts, most segregation is lost in statistical calculations.*

Even if we were to satisfactorily remove the categorisation problems, we still need to decide upon calculation method. The most established methods are index calculations of the deviations of different sub-areas from the survey area's mean population composition of income groups or ethnic categories. The index value is represented on a scale from 0 to 1 (or 100): From no segregation to full separation, i.e., the two groups live completely separated from one another. There are also many other indexing methods. Recently, attempts have been made to take account of the fact that deviations from the survey area's mean population composition may be geographically clustered to form larger coherent districts of, for example, an ethnic minority. In a traditional segregation index, no such consideration is taken; instead, each area is treated independently from its surroundings (White 1983, Johnston et al. 2005).

4. Segregation theory

Three theoretically distinct types of segregation have dominated segregation research. Demographic housing segregation refers to differences in geographical breakdowns by age, sex and household type. Socio-economic segregation means that class and differences in resources determine where people live in a city. Ethnic or racial segregation refers to the segregation of individuals who share certain characteristics (ethnic, religious, physical) from people who have other attributes.

The question of whether segregation is enforced or freely chosen can be asked for all three types of segregation. Generally, the socio-economic dimension best explains the origin of segregation patterns. The geographic distribution of housing stock also plays a role (Danermark 1983). A housing market characterised by concentration of forms of tenure and housing type, with different forms dominating different residential areas, will automatically contribute to socio-economic segregation due to the uneven allocation of income groups across types of tenure. An area dominated by expensive freehold properties is simply not available to households with limited financial resources. According to Skifter Andersen et al. (2015), such segmentation can explain about half of the ethnic housing segregation in the Stockholm area, where immigrants are strongly overrepresented in rental properties which in turn are unevenly distributed across residential areas.

Although differences in resources are considered to be the main explanation for segregation, it is impossible to ignore the other segregation forms. There is a close relationship between demography, socio-economic status and ethnicity that affect housing patterns. For example, it is well known that work force participation rates are low in some ethnic groups, who are consequently referred to rental housing or areas where prices are lower. A low household income is also more common among young adults and single parents. Newly arrived migrants are not only new to the labour market - many also have a relatively low median age, which, along with being new in Sweden, makes them particularly vulnerable. However, the demographic aspects of segregation are poorly understood because almost all research has concentrated on the other two forms of segregation.

While there is a lack of research on demographic segregation, much more light has been shed on the ethnic

dimensions of segregation. In addition, the largest fluctuations in explanation approaches have also been made here. Until the middle of the 1990s cultural approaches dominated. Segregation was often considered to be the result of voluntary isolation among the culturally "divergent" (see Molina 1997 cf. Lindberg 1967). Since then, there has been a reorientation of Swedish research. The focus has shifted to the mainstream political agenda and the Swedish majority's reactions to increased ethnic diversity in the public realm. Concepts such as "white flight" have been imported from the United States to illustrate both the over-representation of the resource-rich population among those moving out, and their underrepresentation among those moving to vulnerable areas (Bråmå 2006).

5. Modern forms of housing segregation

Segregation analyses have traditionally focused on urban settlement patterns. The definition of "urban area" or "city" is however not straightforward. The city as a legal concept disappeared in Sweden with the municipal reform of 1971. Researchers must therefore always provide reasons for their choice of study area. In recent studies, an administrative area, like a municipality, is often chosen with the argument that the municipality makes decisions about the built environment - what is built and, indirectly, for whom, and what service level is provided. However, the fact that housing segregation should be understood as a sorting process involving both the material structures and household resources and preferences provides a persuasive argument for defining the housing market where the sorting takes place as the study area. Segregation dynamics not only concern changes in patterns within cities, but also the relationship between city and rural areas. Larger cities in particular are best regarded as urban regions, as both the built environment and households' daily activities extend over urban and municipal boundaries. To study this dynamic, labour market regions, as defined by commuting streams, are closely related to the field of research. The link between work, income levels and housing also becomes evident.

Hedman & Andersson (2016) examined the development of income and ethnic segregation in Sweden's labour market regions between 1990 and 2010. In all regions, ethnic segregation was greater than income-based segregation. However, while ethnic segregation was relatively stable, income-based segregation increased in 70 out of 100 regions. They also found, as confirmed by other studies, that the correlation between ethnic and income segregation forms has increased over time. Areas with a high number of low-income earners tend to also have a high proportion of residents born outside of Europe. How this process occurs is the subject of an in-depth study of Malmö (Andersson & Hedman 2016).

This dual segregation is not new. It was already noted in the background material to the investigation that preceded Sweden's first major urban policy proposition in 1998 (Government Bill 1997/98: 165). However, since then this correlation has increased significantly. A growing number of cities have residential areas with high concentrations of people who are dependent on income support and have immigrant backgrounds. These areas are often also associated with problems such as poor public health and weak school results. These areas have alternately been called distressed neighbourhoods, areas of exclusion, or immigrant-dense areas since the mid-1990s. Sometimes, the concept "ethnic hierarchy" is used to highlight that certain categories, such as people born in Africa and the Middle East, are particularly concentrated in places of this nature, while immigrants from Eastern and Western Europe have a housing pattern more like people of Swedish origin.

Linköping and Malmö – two examples

No matter how they are defined, the number of distressed neighbourhoods in all major urban regions has increased since the early 1990s. (This does not necessarily mean changes in the index measures for socio-economic and ethnic segregation, especially not for the latter, see also Östh et al., 2014b). The development of these areas has varied across cities and regions, although the general problems are consistent across time and space. To illustrate, we have chosen to map the development of the Linköping and Malmö labour market regions. The index-based ethnic segregation level has fallen slightly in both cases, while income-based segregation has increased significantly. To level out the differences in housing patterns, every second non-Western immigrant would have to move towards more Swedish-populated areas, and every fourth high-income earner would need to move towards areas with high numbers of low-income earners. Malmö exemplifies a segregation context often characterised by metropolitan regions, and the case of Linköping shows that these trends are also evident in other urban regions. Data in Figures 3 and 5 refer to respective entire labour market regions, while the graphs in Figures 2 and 4 only show the urban core areas of the regions.

To illustrate developments in the last quarter century, we have chosen a strict definition of concentration: the neighbourhood (SAMS) should have a high proportion of either low-income earners or persons born outside the western world. By high proportion, we mean that the share in the neighbourhood is above the mean value of the region by at least two standard deviations. Areas with a high share of low-income people are called "resource-poor", while those with high proportion born in non-Western countries are called "sparsely Swedish-populated". The total number of residential areas in the analysis is largely consistent for both regions during the period (335 for Linköping, 778 for Malmö).

There is a very strong statistical correlation between resource-poor and sparsely Swedish-populated areas. Out of Linköping's 19 resource-poor areas in 2014, 15 were

sparsely Swedish-populated. Out of the region's 17 sparsely Swedish-populated areas, 15 were resource-poor. In total, 15 areas are both sparsely Swedish-populated and resource-poor. These neighbourhoods have more than 17,000 residents in working ages. The situation was different a quarter-century ago. In 1990 eight areas were resource-poor and 12 sparsely Swedish-populated, and only four shared both properties. In Linköping's case, the requirement for two standard deviations above the average meant that the criteria for low-income earners increased from 48 percent to 54 per cent, for sparsely Swedish-populated from 7.6 per cent to 22.5 per cent. The latter reflects a generally increasing presence of immigrants from non-Western countries in the region. A high concentration has a different meaning in 2014 than it did in 1990.

In Malmö's labour market region, the number of areas that met both definition requirements increased from 11 in 1990 to 25 in 2014. At the same time, the criteria for sparsely Swedish-populated increased considerably, from just over 10 per cent to 32 per cent. The criteria of concentration of low-income earners increased slightly, from 54 per cent to 59.5 per cent. In total, over 30,000 people of working age live in distressed areas in Malmö, when defined this way.

As shown in the maps below, areas that in 1990 were characterized as both sparsely Swedish-populated and resource-poor remained so in 2014. However, the number of areas with both these attributes has increased over time. The increase has occurred in rental-dominated areas, which in practice are the only areas available for households with very low incomes. More detailed attributes of the resource-poor and sparsely Swedish-populated neighbourhoods compared with all other areas in each region are shown in the charts, for 2014. The resource-poor and sparsely Swedish-populated areas (see Figures 3 and 5) are characterised by a low employment rate, low education rates, a large proportion of welfare recipients, a large proportion of rental homes, overcrowding and poor school results. The areas also have a high rate of resettlement, are usually located on the outskirts of the city, and were often built under the Million Dwellings Programme. The contrast would be even greater if comparing with areas dominated by single family ownership housing.

Figure 2. Areas of Linköping with a particularly high concentration of low-income earners and persons born outside the western world, 1990 (2 SAMS areas) and 2014 (10 SAMS areas).

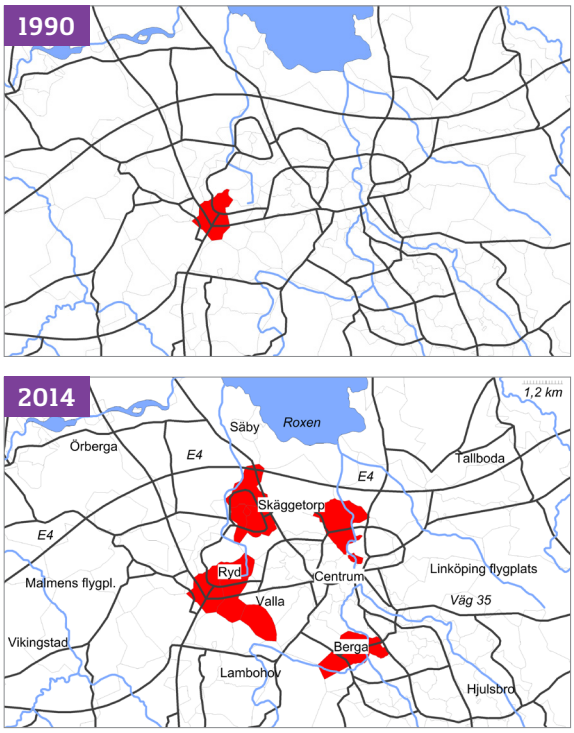


Figure 3. Some key data for Linköping labour market region 2014. Residents per room refers to the entire population, the merit value refers to the passing of grade 9, other figures refer to the population aged 20-64 years.

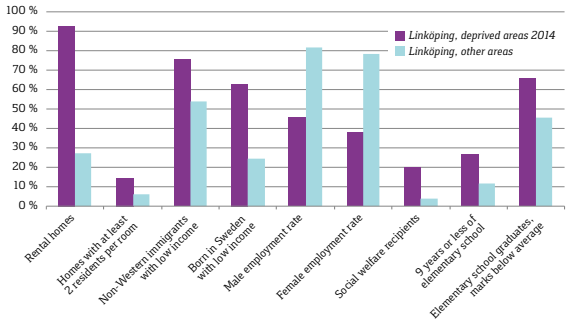
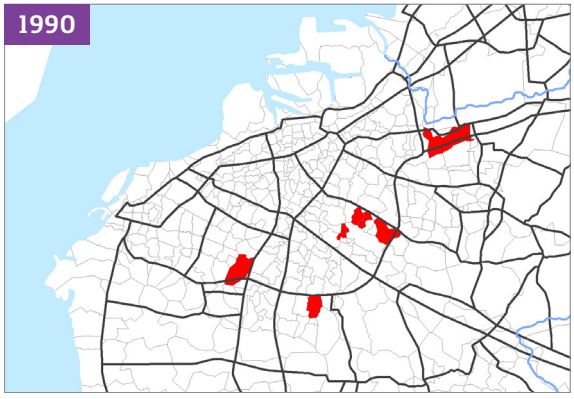


Figure 4. Areas in Malmö with a particularly high concentration of low-income earners and persons born outside the western world, 1990 (9 SAMS areas) and 2014 (25 SAMS areas).



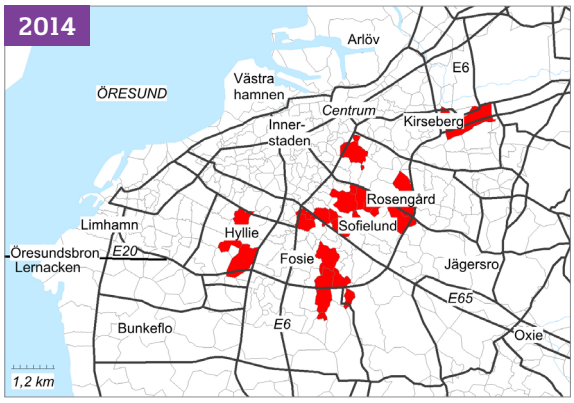
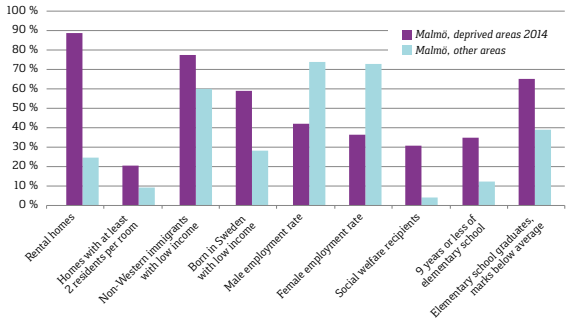


Figure 5. Some key data for the Malmö labour market region 2014. Residents per room refers to the entire population, the merit value refers to the passing of grade 9, other figures refer to the population aged 20-64 years.



6. The consequences of segregation

Research on the consequences of segregation, so-called neighbourhood effects, has increased sharply in the recent decades and is now relatively extensive. The main result of the research is that the geographical distribution of households affects people's living opportunities. The consequences may be positive for those living or growing up in resource-rich areas, while most studies show that segregation has negative consequences for those living in less advantageous neighbourhoods (Sampson 2012). Swedish research on neighbourhood effects usually studies the consequences of the socio-economic composition in the areas. Neighbourhoods are usually described according to the proportion of low-income or high-income earners, the proportion of unemployed and/or the proportion of high-skilled or low-skilled people. Both Swedish and international research show that residents living in socio-economically weaker areas are negatively affected by segregation in terms of effects on school results, educational levels and opportunities in the labour market and health and lifestyle habits (for research reviews, see van Ham et al., 2012; Musterd et al. forthcoming).

Few Swedish studies have studied the effects of ethnic composition exclusively, and they usually find no effect - or a positive one. Living with other immigrants from the same country may be positive for the individual if the group's socio-economic position is relatively strong (Andersson et al., 2006; Edin et al., 2003). This is comparatively consistent with research from other countries. Besides the research on socio-economic outcomes, there is also research on the correlations between segregation and different aspects of health. The relationship between segregation and health can be discussed both from a short-term perspective, where the residential environment can affect health-related behaviours and attitudes, and thus health, and from a longer-term perspective, where health is gradually affected by the residential environment (Gould Ellen et al., 2001). Among the Swedish studies in this field we find research on the correlation between segregation and diabetes (White et al., 2016) and cardiovascular disease (Merlo et al., 2013). In both studies, it was found that residents in distressed areas are at an increased risk of developing these diseases.

Individual socio-economic attributes and health status are documented in Swedish registers which partly explains why so much research has been directed towards these aspects. There are significantly fewer studies on the "softer" outcomes, such as how segregation affects social interaction between people (see Legeby 2013) or attitudes towards others. One study shows that ethnic composition affects the inclination of voting for xenophobic parties, but this connection also seems to be associated with other factors - especially with the area's employment rate (Strömblad & Malmberg 2015). There is also some Swedish research on segregation and crime, for example on the correlation between segregation and car burnings (Malmberg et al., 2013) and on how the residential area affects the risk of being exposed to different types of crime (little or no effect, depending on the type of crime [Nilsson & Estrada 2007; Estrada & Nilsson 2008]). How segregation affects organised crime remains to be investigated.

However, important research is lacking in several areas. There is no general consensus on pressing issues such as the extent of the effects of segregation, at which degree of segregation they arise, who is affected, and how these effects develop. New research shows that effects are larger when neighbourhoods are defined on an individual basis, as an individual's immediate surroundings, rather than administrative areas. They also vary with geographical scale (neighbourhood size) and neighbourhood attributes (such as the proportion of highly educated, foreign born or single persons) (Andersson & Malmberg 2015; 2016). However, we know that neighbourhood effects in the Swedish context are relatively small compared with countries with greater socio-economic polarisation. We also know that factors such as individual ability, parents' social status and current life situation are generally more important than residential area for the chances of, for example, getting a job. It is also likely that negative effects only arise at a certain level of segregation or concentration of exclusion but European results are mixed on this matter (for a U.S.-American

overview, see Galster 2014).

The size of the effects also varies between individuals (Sharkey & Faber 2014). Characteristics and external attributes, personality and certain genetic features can determine the extent to which individuals are affected by their immediate surroundings (for example, through the ability to withstand stress factors). Children are usually more exposed than adults as they spend more time in their residential area. Research from the United States shows that early relocation into a "better" area can significantly improve a child's future life opportunities (Chetty et al. 2016) while growing up in resource-poor area can have lasting effects well into adulthood (Wheaton & Clark 2003; Hedman et al., 2015).

The issue of how neighbourhood effects are transmitted is often described as a "black box". We know what goes into and comes out of it, but not what's happening inside. Therefore, more qualitative studies and interaction between different disciplines are needed. However, the likely mechanisms can be summarised in four areas: social, geographical, environmental and institutional (Galster 2012). These include everything from group pressure and local role models to quality of local institutions and area stigmatisation. In one of few qualitative studies, Pinkster (2009) demonstrates how neighbourhood effects can occur through different social mechanisms. She shows how inadequate social networks, negative socialisation processes, inadequate social organisation and social infrastructure affect job seeking strategies and attitudes towards work in people in a distressed area in The Hague, Netherlands. A certain appreciation of the importance of different mechanisms can be obtained by estimating the neighbourhood effects at different levels of scale. While local networks are being formed in the immediate area, factors related to the local labour market are better linked to a higher geographical level.

Apart from consequences for the individual's socio-economic status, segregation may also create a negative development spiral. The notion that segregation has negative consequences affect people's housing choices and make them avoid areas that are, in their view, problematic. Surveys have shown that various social problems, violence and problems in schools are factors that households take into consideration when deciding on where to live. This in turn reinforces existing segregation patterns. In the long run, this leads to further stigmatisation and negative consequences for social integration.

7. Research needs

Despite relatively extensive research on the causes and consequences of segregation, many questions remain to be answered. In regards to ethnic segregation, research about the relationship between length of residence in Sweden and settlement patterns needs to be better investigated. There are indications that many immigrants find it difficult to advance in the housing market. Research on the link between housing segregation and labour market integration, health and safety needs to be explored, as well as research on the residential environment of individuals and households over lifecycles and across generations. Not least, this is relevant in light of the large group of refugees that arrived in Sweden during 2015. There is also a need for more research about different settlement policies for newly arrived migrants and how these affect the possibilities for further integration. In this area, there are good research opportunities for long-term follow-up. At the same time, it is important to focus on the middle class's residential choices and preferences to understand the segregation problem as a whole (see Rodenstedt 2014). How do flight and avoidance strategies look like in segregated Sweden?

With the set-up of the new dwelling register from 2013, Swedish scholars have good opportunities to systematically study the development of demographic segregation. There is a significant need for research that analyses changes in household residence, such as overcrowding, and links the analyses to other forms of segregation.

There are also opportunities for better method development. In recent years, there have been new opportunities to work with coordinate-based data and adapt urban areas to the research question being investigated (see, for example, the references to Östh et al.). The method can be used for segregation analyses as well as for analyses of the consequences of segregation.

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